It will be seen from the above that not a word was said by Professor Moore about the climate of the State of Kansas. But for some unexplained reason newspapers and correspondents who desired to injure that State, or possibly to injure the reputation of the Weather Bureau, disseminated fraudulent statements regarding this testimony; the blame for thus creating a false impression as to the climate of Kansas must rest upon them and not upon the Chief of the Weather Bureau. Professor Moore adds the following, based upon the official records of observations by the hundreds of observers who have reported to the Weather Bureau, the medical staff of the Army, and the Smithsonian Institution:

It is my duty to publish the simple, ungarnished facts in regard to the climatic conditions of the United States. Our people want the truth so that they may not be misled either by those who honestly, but nevertheless ignorantly, claim that hot winds and droughts will never again come, or by those who, when periods of deficient rainfall occur, as they have in the past and as they certainly will in the future, preach discouragement and the abandoning of lands which, on the average of a long period of years, it would be profitable to cultivate.

I have made a careful examination of the Government records, with a view of putting before those interested in the matter a correct statement regarding the rainfall and wind of both Kansas and Nebraska. These records are made by trained observers and represent the most accurate information that is obtainable. The Government records, as is well known, are in a class separate and distinct from the recollections of the oldest inhabitants.

In the last fifty years records of rainfall in Kansas have been made only in the eastern part of the State. In the western part of the State, which is really the debatable ground, a single record has been made, viz, at Dodge, extending back to 1875. Likewise in Nebraska, the record for North Platte is the only one that extends back to the early seventies. The mean annual rainfall at Dodge for the entire period of observation is 20.8 inches, and at North Platte, 18.7 inches.

Considering the record for the last thirty years only, since it is convenient to subdivide that number into periods of equal length, the mean becomes for Dodge, 21.3 inches, and for North Platte, 19.0 inches. I have also had computed the average rainfall for 3 additional stations in Kansas, 3 in Nebraska, and 1 each in Iowa and Missouri for the last thirty years, to see whether the conclusions reached from a consideration of the Dodge and North Platte data are of local or general application. The averages in periods of ten years each appear in the table below, from which it may be clearly seen that the first and last ten years were periods of fairly abundant rainfall, and that the middle ten years was a period of deficient rainfall. It will be further seen, and this is the important point in the discussion, that there is practically no difference between the rainfall of the first ten years and the last ten years. Three of the ten stations show that the last ten-year period had a slightly greater rainfall than the first, but the difference is so small that it is really immaterial. The remaining stations show a slightly less rainfall in the last ten years than in the first. This table clearly shows, therefore, that the rainfall has neither increased nor diminished by amounts worthy of consideration.

The heavy rains of 1906, and also the year previous, were common to all of that vast stretch of territory west of the ninety-fifth meridian. It was not a local phenomenon centered in western Kansas and western Nebraska, since equally heavy rains fell in Colorado, Utah, western Texas, Oklahoma, New Mexico, Arizona, Nevada, and central and southern California. The explanation of the heavy rains can not be attributed to local conditions of soil and moisture, since, as has just been stated, the heavy rains were common to the arid and mountain regions of the Southwest, where very little agriculture is practised.

Mean rainfall at the stations named.

Stations and periods of observation.	For the full period of observation.	For the 30 years 1877–1906, in periods of 10 years.			
		First.	Second.	Third.	Mean.
	Inches.	*Inches.*	*Inches.*	*Inches.*	*Inches.*
Dodge, Kans., 1875-1906	20.8	22.8	18.4	22.7	21.3
North Platte, Nebr., 1875-1906	18.7	20.1	17.2	19.8	19.0
Independence, Kans., 1872-1906	37.1	39.1	35.5	38.1	37.6
Genoa, Nebr., 1875-1906	28.2	26.3	26.4	31.3	28.0
Manhattan, Kans., 1858-1906	30.6	33.4	29.2	31.9	31.5
Lawrence, Kans., 1868-1906	36.4	35.1	39.2	36.7	37.0
Omaha, Nebr., 1871-1906	30.7	37.6	25.6	27.9	30 4
Minden, Nebr., 1878-1906	31.5	36.1	29.2	29.8	31.7
Oregon, Mo., 1866-1906	35.6	37.1	32.3	39.5	36.3
Keokuk, Iowa, 1872-1906	35.0	35.4	31.4	35.1	34.3

The statement has also been made that the winds are diminishing. An examination of the wind records in Kansas and Nebraska shows that the last fifteen years have not been quite so windy as the fifteen years previous, and this is especially true of the years 1904, 1905, and 1906. It is not safe to assume, however, that a permanent decrease in the wind velocity has taken place.

As the citizens of Kansas, like those of other States, have learned how to adapt their lives and their agriculture to local climatic conditions, it is very important that correct climatological information be disseminated, so that all citizens may understand exactly what the peculiarities of the local climate are, and be prepared to take advantage of them. To do this the figures given in the preceding table should be quoted and studied, and together with these one should consider the records of sunshine and temperature, for everyone knows that plants and crops can be raised in any climate, and that every region on the globe has its advantages as well as its disadvantages.

WATERSPOUTS IN MARYLAND.

By WILLIAM L. MAYO. Dated Tarlac, Tarlac Province, P. I., December 22, 1906.

Among the valuable articles contained in the MONTHLY WEATHER REVIEW, I have been especially interested in the articles in the July and August numbers of this year telling about the waterspout in Vineyard Sound. Reading the differences of opinion as to whether there were two well-defined spouts or just one in different phases recalls to my mind two waterspouts that I saw a short distance inside the mouth of Chester River, Maryland, Saturday, July 13, 1901. I made a note of them in my diary, but unfortunately neglected to note other conditions at the time. The conditions that I remember distinctly are as follows:

The waterspouts appeared very nearly simultaneously about two o'clock in the afternoon, at the close of a heavy wind and rainstorm that had lasted, with rather unusual force for a summer storm, since very early that morning, and the storm came from the east. I was a member of the State militia at the time, and we had embarked on the yacht *Sylvia* and gone up Chesapeake Bay to Queenstown, Md., where we were to encamp for ten days. A high sea was running from the force of the wind, which blew in heavy puffs and did not draw steadily as our winds from that direction usually do. We had dropt anchor opposite our landing, and were waiting for the small boats to carry us ashore. I was seated at the stern of the vessel when my attention was called by a hollow, roaring sound to a small waterspout moving past, parallel to the east shore of a small island that was about a half-mile from us. While I was watching that, some one said excitedly, "Look at this other waterspout," and on the west side of the island there was another waterspout more than double the size of that on the east side. The smaller one, which was on the east side, began first, and was in action fully three minutes before the second and larger spout on the west side appeared. They were in violent action at the *same time* for at least five minutes (I make conservative estimates as to the duration of the intervals); then the smaller began to waver in the center of its column, the base half dropt down with a sullen roar, and the upper portion waved a few moments like a streamer and disappeared. The cloud portion of the smaller waterspout began to drift toward the cloud portion of the larger spout, and it lookt very much as if the smaller spout was put out of action because its aerial whirl was drawn into the whirl of the larger spout. Before the first spout had quite disappeared, the volume of the second increased rapidly and its rotation became more violent, the cloud bulged downward, and had an ugly, blackish-gray hue. The water was churned into foam and the whole mass dragged itself along for a few minutes more, making a rushing, roaring sound. A small point of land lay in the course of the spout, and when the base reached the shore the column suddenly broke and fell on the point, among the trees. The column of falling water was more than twice as high as the trees, and when the air cleared of the mist there

was a well-defined path thru the woods; none but the tall, strong trees were standing, and these had their branches very nearly all stript off. When the spout was relieved of the weight of its base it swung out in a long, flattened curve, very much like a long rope hanging from a ship's rigging when one end is free and the wind is blowing.

We were surprised to see such an unusual demonstration at that time, because we were at anchor in calm water; for the storm had lost its energy fully a half hour before the appearance of the two spouts. It was sultry and hot where we were, and the sun was not shining directly on us, yet the clouds seemed so thin that the heat came thru very readily and diffused itself in the still air. The trees on the surrounding shores showed no evidence of wind, nor did the surface of the water. It was a dead calm, except for a little swell. I recall no thunder and lightning during the morning storm nor at the time of the waterspouts. That evening, shortly after sunset, we had a terrific thunderstorm, and during all the encampment we had severe thunderstorms and floods of rain. As we were living in tents, life was far from pleasant. * * * I have left out uncertainties, and the only part that might be doubtful is whether the larger spout was on the west side of the island or whether the spouts occurred in reverse directions from what I have stated. The sun was not shining nor do I know the direction of the tide, hence the points mentioned above might be questioned, but not their actual occurrence.

WEATHER BUREAU MEN AS EDUCATORS.

Dr. O. L. Fassig, on January 10, 1907, delivered the first of a series of ten lectures on "Weather and climatology" at Johns Hopkins University, Baltimore, Md.

Under date of January 30, 1907, Mr. M. L. Fuller, Observer, Canton, N. Y., reports that the teaching of meteorology in the St. Lawrence University at Canton has been properly recognized by his formal election as "Professor of Meteorology and Climatology", with voice and vote in the faculty. His course of instruction for junior and senior students involves two or three one-hour lectures per week, and by unanimous request of the students enrolled therein the work will be extended thru the remainder of the college year. A course embracing only one semester in climatology has also been outlined for other students who can not take the full course.

Arrangements have been made for a course of eighteen lectures on meteorology and climatology before the Clarkson School of Technology, at Potsdam. The students will be examined in these lectures and receive credit for one hour's work per week. A popular lecture committee representing the University, the School of Technology, and the State Normal School desires also a series of popular lectures. An average of about twelve hours a day has been given to meteorological work since July 1 by Mr. Fuller, and a considerable amount of time by his wife. He has also arranged to employ, at his own expense, an assistant to aid in the preparation of material for class work and lecture work, which expense will consume all of the special allowance made for these lectures by the above-mentioned committee. This extra work has been undertaken in the interest of the service, as the field appeared to be a most promising one.

In later reports Mr. Fuller states that the class beginning the work in general meteorology at St. Lawrence University numbers 28, and 10 of the 90 students of Clarkson School of Technology are enrolled for the course at that institution.

Owing to the absence of the head of the department of geology at the University Mr. Fuller has taken charge of the class in physiography, numbering 20 students. A large portion of the remainder of the course, relating to the atmosphere, the topography of the lands, the climatic control of land forms, etc., will be easily combined with the course in climatology.

Mr. J. Warren Smith, Section Director, on January 3, 1907, began regular lectures to the class in elementary meteorology at the Ohio State University, Columbus, Ohio; the lectures are given twice a week during the winter term.

Mr. A. H. Thiessen, Section Director, Raleigh, N. C., on January 19, 1907, began his regular course of lectures to seniors in the agriculture course at the Agricultural and Mechanical College, West Raleigh; the course will be practically the same as that given last year.

Mr. John R. Weeks, Local Forecaster, Binghamton, N. Y., under date of February 16, submits a manuscript lecture "On the weather—what it is and how it is observed and forecast". The text occupies about sixteen pages of manuscript, and is accompanied by a list of about a hundred slides, belonging to the Weather Bureau. When the lecture is transmitted for use copies of brief printed articles are also inclosed for the use of the lecturer, who is asked to read them and present a synopsis of their contents in connection with the exhibition of the slides. There are more slides in this lecture than in those usually delivered by the New York State Department of Education in order to provide additional popular interest. It is expected that the lectures and notes will be memorized, and that the lecturer will not read from the manuscript. Mr. Weeks states that this lecture has already been read and the slides exhibited by five persons to whom it has been loaned, and that about forty requests for its loan were received during February. He suggests the practicability of placing such a lecture, "localized for each State", in the hands of each section director, to be loaned to schools, free of cost, for public use.

This recommendation is quite in line with the work that has been done in the State of New York during the last twenty years by Prof. Albert S. Bickmore, "father" of the American Museum of Natural History in New York City. Thru his efforts in the line of geography and travel the Education Department of the State has organized a Division of Visual Instruction, of which Mr. De Lancey M. Ellis is now chief; and Mr. Ellis has issued a circular letter, dated Albany, February 1, 1907, in which he indorses Mr. Weeks's efforts and explains the conditions under which his lecture can be obtained:

> Mr. Weeks offers to send the manuscript and slides without cost to any school in the State, under the general rules governing the loan of slides issued by this department. These provide that slides shall not be used for other than educational purposes, nor upon any occasion at which an admission fee is charged or a collection of any kind is taken. Borrowers must also agree to bear cost of loss or breakage. Slides are sent by mail under Government frank, and provision is made for their return in the same way.

We heartily indorse the following paragraph from one of Mr. Weeks's letters:

> A high official once said to me that it is a waste of time to lecture to high school students and that lectures to older people were more important. My belief and experience is just the opposite, for at least two reasons. It is much easier to reach, interest, and convince high school students, and once interested they have time and opportunities for studying the subject that older persons do not have. Their minds are also free from the notions that older persons so easily get in regard to the weather. The high school boys and girls of to-day are the business men and women of four or five years from now; but now is the time to reach them with such instruction, not when they are absorbed with business cares and worries.

The Department of Education of the State of New York, with its headquarters at Albany, and Dr. Andrew S. Draper as Commissioner of Education, seems to have associated together under it the Regents of the University, the Director of the State Library, the Director of the State Museum, the Division of Visual Instruction, under De Lancey M. Ellis, and many other branches of activity bearing on education thruout its whole range from the kindergarten to the university. The